

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## s17 Geometric Series Exam (Example v100)

### Question 1

Consider the partial geometric series represented below with first term  $a = 476$ , common ratio  $r = \left(\frac{19}{34}\right)^{1/10}$ , and  $n = 10$  terms.

$$S = 476 + 449.09 + 423.7 + 399.75 + 377.15 + 355.83 + 335.72 + 316.74 + 298.83 + 281.94$$

We can multiply both sides by  $r$ .

$$rS = 449.09 + 423.7 + 399.75 + 377.15 + 355.83 + 335.72 + 316.74 + 298.83 + 281.94 + 266$$

What is the value of  $S - rS$ ?

### Question 2

Consider the geometric series shown below, using ellipsis notation to indicate a continuation of the pattern without writing every term.

$$S = 4 + 4(5) + 4(5)^2 + 4(5)^3 + \cdots + 4(5)^{47} + 4(5)^{48} + 4(5)^{49} + 4(5)^{50}$$

Identify the initial term, the common ratio, and the number of terms.

### Question 3

Write a proof for the partial geometric series formula.

- a. Define the variables.
- b. Write the sum using variables and ellipsis notation. You can implicitly assume the number of terms is more than the number of terms you choose to write.
- c. Using annotated algebraic manipulation, produce the partial geometric series formula.

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## s17 Geometric Series Exam (Example v101)

### Question 1

Consider the partial geometric series represented below with first term  $a = 800$ , common ratio  $r = \left(\frac{13}{25}\right)^{1/10}$ , and  $n = 10$  terms.

$$S = 800 + 749.36 + 701.92 + 657.49 + 615.87 + 576.89 + 540.37 + 506.17 + 474.12 + 444.11$$

We can multiply both sides by  $r$ .

$$rS = 749.36 + 701.92 + 657.49 + 615.87 + 576.89 + 540.37 + 506.17 + 474.12 + 444.11 + 416$$

What is the value of  $S - rS$ ?

### Question 2

Consider the geometric series shown below, using ellipsis notation to indicate a continuation of the pattern without writing every term.

$$S = 6 + 6(3) + 6(3)^2 + 6(3)^3 + \cdots + 6(3)^{66} + 6(3)^{67} + 6(3)^{68} + 6(3)^{69}$$

Identify the initial term, the common ratio, and the number of terms.

### Question 3

Write a proof for the partial geometric series formula.

- a. Define the variables.
- b. Write the sum using variables and ellipsis notation. You can implicitly assume the number of terms is more than the number of terms you choose to write.
- c. Using annotated algebraic manipulation, produce the partial geometric series formula.

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## s17 Geometric Series Exam (Example v102)

### Question 1

Consider the partial geometric series represented below with first term  $a = 518$ , common ratio  $r = \left(\frac{15}{37}\right)^{1/10}$ , and  $n = 10$  terms.

$$S = 518 + 473.28 + 432.42 + 395.09 + 360.98 + 329.82 + 301.34 + 275.33 + 251.56 + 229.84$$

We can multiply both sides by  $r$ .

$$rS = 473.28 + 432.42 + 395.09 + 360.98 + 329.82 + 301.34 + 275.33 + 251.56 + 229.84 + 210$$

What is the value of  $S - rS$ ?

### Question 2

Consider the geometric series shown below, using ellipsis notation to indicate a continuation of the pattern without writing every term.

$$S = 7 + 7(6) + 7(6)^2 + 7(6)^3 + \cdots + 7(6)^{49} + 7(6)^{50} + 7(6)^{51} + 7(6)^{52}$$

Identify the initial term, the common ratio, and the number of terms.

### Question 3

Write a proof for the partial geometric series formula.

- a. Define the variables.
- b. Write the sum using variables and ellipsis notation. You can implicitly assume the number of terms is more than the number of terms you choose to write.
- c. Using annotated algebraic manipulation, produce the partial geometric series formula.

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## s17 Geometric Series Exam (Example v103)

### Question 1

Consider the partial geometric series represented below with first term  $a = 799$ , common ratio  $r = \left(\frac{18}{47}\right)^{1/10}$ , and  $n = 10$  terms.

$$S = 799 + 725.88 + 659.45 + 599.1 + 544.27 + 494.46 + 449.21 + 408.1 + 370.75 + 336.82$$

We can multiply both sides by  $r$ .

$$rS = 725.88 + 659.45 + 599.1 + 544.27 + 494.46 + 449.21 + 408.1 + 370.75 + 336.82 + 306$$

What is the value of  $S - rS$ ?

### Question 2

Consider the geometric series shown below, using ellipsis notation to indicate a continuation of the pattern without writing every term.

$$S = 2 + 2(5) + 2(5)^2 + 2(5)^3 + \cdots + 2(5)^{59} + 2(5)^{60} + 2(5)^{61} + 2(5)^{62}$$

Identify the initial term, the common ratio, and the number of terms.

### Question 3

Write a proof for the partial geometric series formula.

- a. Define the variables.
- b. Write the sum using variables and ellipsis notation. You can implicitly assume the number of terms is more than the number of terms you choose to write.
- c. Using annotated algebraic manipulation, produce the partial geometric series formula.



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## s17 Geometric Series Exam (Example v104)

### Question 1

Consider the partial geometric series represented below with first term  $a = 990$ , common ratio  $r = \left(\frac{31}{55}\right)^{1/10}$ , and  $n = 10$  terms.

$$S = 990 + 934.84 + 882.74 + 833.56 + 787.11 + 743.25 + 701.83 + 662.73 + 625.8 + 590.93$$

We can multiply both sides by  $r$ .

$$rS = 934.84 + 882.74 + 833.56 + 787.11 + 743.25 + 701.83 + 662.73 + 625.8 + 590.93 + 558$$

What is the value of  $S - rS$ ?

### Question 2

Consider the geometric series shown below, using ellipsis notation to indicate a continuation of the pattern without writing every term.

$$S = 2 + 2(5) + 2(5)^2 + 2(5)^3 + \cdots + 2(5)^{74} + 2(5)^{75} + 2(5)^{76} + 2(5)^{77}$$

Identify the initial term, the common ratio, and the number of terms.

### Question 3

Write a proof for the partial geometric series formula.

- a. Define the variables.
- b. Write the sum using variables and ellipsis notation. You can implicitly assume the number of terms is more than the number of terms you choose to write.
- c. Using annotated algebraic manipulation, produce the partial geometric series formula.

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## s17 Geometric Series Exam (Example v105)

### Question 1

Consider the partial geometric series represented below with first term  $a = 837$ , common ratio  $r = \left(\frac{4}{9}\right)^{1/10}$ , and  $n = 10$  terms.

$$S = 837 + 771.8 + 711.69 + 656.25 + 605.14 + 558 + 514.54 + 474.46 + 437.5 + 403.42$$

We can multiply both sides by  $r$ .

$$rS = 771.8 + 711.69 + 656.25 + 605.14 + 558 + 514.54 + 474.46 + 437.5 + 403.42 + 372$$

What is the value of  $S - rS$ ?

### Question 2

Consider the geometric series shown below, using ellipsis notation to indicate a continuation of the pattern without writing every term.

$$S = 3 + 3(2) + 3(2)^2 + 3(2)^3 + \cdots + 3(2)^{47} + 3(2)^{48} + 3(2)^{49} + 3(2)^{50}$$

Identify the initial term, the common ratio, and the number of terms.

### Question 3

Write a proof for the partial geometric series formula.

- a. Define the variables.
- b. Write the sum using variables and ellipsis notation. You can implicitly assume the number of terms is more than the number of terms you choose to write.
- c. Using annotated algebraic manipulation, produce the partial geometric series formula.

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## s17 Geometric Series Exam (Example v106)

### Question 1

Consider the partial geometric series represented below with first term  $a = 544$ , common ratio  $r = \left(\frac{19}{32}\right)^{1/10}$ , and  $n = 10$  terms.

$$S = 544 + 516.37 + 490.14 + 465.24 + 441.61 + 419.18 + 397.89 + 377.68 + 358.49 + 340.28$$

We can multiply both sides by  $r$ .

$$rS = 516.37 + 490.14 + 465.24 + 441.61 + 419.18 + 397.89 + 377.68 + 358.49 + 340.28 + 323$$

What is the value of  $S - rS$ ?

### Question 2

Consider the geometric series shown below, using ellipsis notation to indicate a continuation of the pattern without writing every term.

$$S = 4 + 4(3) + 4(3)^2 + 4(3)^3 + \cdots + 4(3)^{86} + 4(3)^{87} + 4(3)^{88} + 4(3)^{89}$$

Identify the initial term, the common ratio, and the number of terms.

### Question 3

Write a proof for the partial geometric series formula.

- a. Define the variables.
- b. Write the sum using variables and ellipsis notation. You can implicitly assume the number of terms is more than the number of terms you choose to write.
- c. Using annotated algebraic manipulation, produce the partial geometric series formula.

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## s17 Geometric Series Exam (Example v107)

### Question 1

Consider the partial geometric series represented below with first term  $a = 504$ , common ratio  $r = \left(\frac{37}{63}\right)^{1/10}$ , and  $n = 10$  terms.

$$S = 504 + 477.88 + 453.11 + 429.62 + 407.36 + 386.24 + 366.22 + 347.24 + 329.25 + 312.18$$

We can multiply both sides by  $r$ .

$$rS = 477.88 + 453.11 + 429.62 + 407.36 + 386.24 + 366.22 + 347.24 + 329.25 + 312.18 + 296$$

What is the value of  $S - rS$ ?

### Question 2

Consider the geometric series shown below, using ellipsis notation to indicate a continuation of the pattern without writing every term.

$$S = 7 + 7(5) + 7(5)^2 + 7(5)^3 + \cdots + 7(5)^{54} + 7(5)^{55} + 7(5)^{56} + 7(5)^{57}$$

Identify the initial term, the common ratio, and the number of terms.

### Question 3

Write a proof for the partial geometric series formula.

- a. Define the variables.
- b. Write the sum using variables and ellipsis notation. You can implicitly assume the number of terms is more than the number of terms you choose to write.
- c. Using annotated algebraic manipulation, produce the partial geometric series formula.



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## s17 Geometric Series Exam (Example v108)

### Question 1

Consider the partial geometric series represented below with first term  $a = 924$ , common ratio  $r = \left(\frac{29}{66}\right)^{1/10}$ , and  $n = 10$  terms.

$$S = 924 + 851.05 + 783.87 + 721.99 + 664.99 + 612.49 + 564.14 + 519.6 + 478.58 + 440.8$$

We can multiply both sides by  $r$ .

$$rS = 851.05 + 783.87 + 721.99 + 664.99 + 612.49 + 564.14 + 519.6 + 478.58 + 440.8 + 406$$

What is the value of  $S - rS$ ?

### Question 2

Consider the geometric series shown below, using ellipsis notation to indicate a continuation of the pattern without writing every term.

$$S = 5 + 5(6) + 5(6)^2 + 5(6)^3 + \cdots + 5(6)^{48} + 5(6)^{49} + 5(6)^{50} + 5(6)^{51}$$

Identify the initial term, the common ratio, and the number of terms.

### Question 3

Write a proof for the partial geometric series formula.

- a. Define the variables.
- b. Write the sum using variables and ellipsis notation. You can implicitly assume the number of terms is more than the number of terms you choose to write.
- c. Using annotated algebraic manipulation, produce the partial geometric series formula.

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## s17 Geometric Series Exam (Example v109)

### Question 1

Consider the partial geometric series represented below with first term  $a = 364$ , common ratio  $r = \left(\frac{35}{52}\right)^{1/10}$ , and  $n = 10$  terms.

$$S = 364 + 349.87 + 336.29 + 323.24 + 310.69 + 298.63 + 287.04 + 275.9 + 265.19 + 254.89$$

We can multiply both sides by  $r$ .

$$rS = 349.87 + 336.29 + 323.24 + 310.69 + 298.63 + 287.04 + 275.9 + 265.19 + 254.89 + 245$$

What is the value of  $S - rS$ ?

### Question 2

Consider the geometric series shown below, using ellipsis notation to indicate a continuation of the pattern without writing every term.

$$S = 7 + 7(8) + 7(8)^2 + 7(8)^3 + \cdots + 7(8)^{82} + 7(8)^{83} + 7(8)^{84} + 7(8)^{85}$$

Identify the initial term, the common ratio, and the number of terms.

**Question 3**

Write a proof for the partial geometric series formula.

- a. Define the variables.
- b. Write the sum using variables and ellipsis notation. You can implicitly assume the number of terms is more than the number of terms you choose to write.
- c. Using annotated algebraic manipulation, produce the partial geometric series formula.